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writings on the subject. When it has studied the first twenty or twenty-five years of the colonial history and learned something of the laws and customs, let them read a few selected pages, taken in succession, of the record of the Massachusetts general court; if towns have been studied about, a few pages of some of the most ancient of New England town records. If the difficulties of the voyages, and of migration have been dwelt upon, some of the extant journals, Higginson's or Winthrop's, etc. But to state such cases as this makes it evident that the material for such work is not now published in available form for class use, and every text-book, and, in fact, every teacher, would need a different set of selections to accompany the class work. Perhaps the time is not far distant when the larger schools will provide funds for printing such supplemental matter as the conduct of the history classes makes desirable.

When a class is more advanced and especially if it is studying only one phase of historical development, such as constitutional history, for example, it needs no text-book. It can draw its material from the general or special histories, and, if it is dealing with institutions, every available document should be studied directly.

WEBSTER COOK

DETROIT HIGH SCHOOL

ELECTIVE WORK IN THE HIGH SCHOOL COURSES. —SHOULD ELECTIVE WORK BE PROVIDED AND ENCOURAGED.

It is the purpose of this paper to introduce the subject of electives in the high school, to present some facts kindly furnished the writer by superintendents and principals throughout the state in answer to seven questions, and to point out some more or less obvious deductions from this correspondence.

Naturally there is quite a difference of opinion among educators of good judgment as to the advisability of offering optional studies, or as to the extent to which substitutions should be allowed. One superintendent in the state says, "We do not think it is necessary to have substitute studies. It gives poor students a chance to form bad habits from frequent changes, and good ones do not need it."

Another superintendent, in a system of schools where an elective course is offered, says, "I am decidedly in favor of electives within bounds. I think it is a cruel wrong to many girls to force them through certain studies, such as geometry and mathematical physics. Many a boy that would shine in a shoe factory or grocery store is spoiled by a diet of Latin for which he has no taste or digestive organs. We have been blindly following the traditions for gentlemen's sons in England,

regardless of their being no more fitted for the mass of American boys than stained glass windows are for a blacksmith shop."

Superintendent Nightingale, of the Chicago high schools, says, "All secondary courses of study, all requirements for admission to college, and all courses in college should be eminently elastic and abound in such substitutions that every pupil will find those studies whose proper pursuit will guarantee to him that intellectual grasp and growth which the infinite architect of his latent mental aptitudes intended him to secure." He adds also, "Give me liberty in courses of instruction or give me death." It might be noted in passing that Superintendent Nightingale's remarks are consistent with the plan of work of the Chicago high schools. Requirements for graduation are arranged much as they are in our own university—the student is required to furnish a certain amount of work of which a considerable portion is optional or elective.

In the general consideration of the subject before us, we must not lose sight of the fact that the several courses of study offered in nearly all high schools allow our students considerable latitude in their choice of work. Three or four large schools in Michigan offer seven complete courses of study. The average number of courses for ten of the larger high schools is five and a half. There are twenty more high schools on the diploma list for four courses, forty others on the same list for three courses, and about twenty other high schools prepare for the university in one or two courses. When we bear in mind that nearly all these high schools offer an English course not now considered as fitting for the university, it is apparent that two thirds of all the high schools in Michigan offer at least two or three courses of study, from which students may make their choice. The expression, a course of study, may be used in two different senses; first, meaning a complete plan of work, as when we say, the classical course; and again, meaning a single study, as a course in chemistry; obviously it must be interpreted in the latter way in discussing the question, "Should elective courses be provided and encouraged?"

The writer is indebted to many superintendents and principals for answers to questions submitted, and for additional suggestions pertaining to the subject. The first question is, "Does your school offer elective, optional, or substitute studies?" Two thirds of the answers to this question are in the affirmative, some of them, however, with important limitations. One principal says, "While there is considerable apparent liberality, the matter is very closely restricted." Another

principal of a large high school says, "Substitutions are allowed students who will not go to college. We have no system about it and each case is settled by itself." (We presume most of the substitutions are naturally found in the English courses.) The second question as to what these optional studies are, finds, as might be expected, a great variety of answers in the different schools. In some few cases it is music and drawing, in two or three cities manual training, in others work in the various sciences, and in still other schools history. So far as any general tendency can be noted, it seems to be toward the practical information studies, commonly so-called, and toward various kinds of laboratory work where students "learn to do by doing."

The third question asked, "Does your school offer any course of study not designed to meet university requirements?" The answers to this question show, as already noted, that most of our high schools offer one or more courses of study not designed to meet university requirements. Quite a number of our larger high schools offer commercial courses. Superintendents and principals do not seem to regard these courses as conducive to strong scholarship, but rather as necessary to meet a local demand. Muskegon, with her new manual training school, offers a total of seven courses, four of which are not designed for university preparation, and include considerable shop work. The answer to the fifth question, "What proportion of students select these courses not designed to meet university requirements," shows greater variation. In Muskegon, with her new equipment, a majority of the pupils are electing the new courses. In a few schools, half of the students or more are in the English courses, but in most of the schools, from which reports were received, rather more than half of the students elect some one of the courses, including work in one or more foreign languages.

The sixth question asked, "what proportion of scholars entering your high school complete a course of study?" The highest proportion reported was 60 per cent. This statement was from one of the best school towns in the state, and was merely the percentage for one class, not an average. Four schools report 50 per cent. or more of the entering class as graduates. The lowest proportion of graduates reported from any school is 10 per cent. The average of all schools, from which reports have been received, shows that one third of the pupils entering our high schools remain to complete a course. The writer is of the opinion that the proportion of graduates in any community depends upon a great variety of local circumstances, and that a

large ratio of graduates may be regarded as both a cause and a result of the efficiency of the school system.

The seventh question asked, "Do you think the proportion of graduates would be increased by offering elective and substitute studies?" About one third of the answers to this query were in the negative. Over two thirds of the persons interrogated believe that a judicious use of electives would increase the number of graduates. Some of the answers were qualified. One principal in a large school where considerable license is given students in a choice of work says, "We think the proportion of graduates is increased by offering elective studies." Another principal of a still larger high school thinks that elective studies would not increase the number of graduates, "unless there were a weak giving way to the demands for an easy course." A certain nation of early antiquity believed that the individual existed for the state, and that nation was for a long period invincible in war, and yet we do not believe that the narrow, rigorous Spartan philosophy resulted in an ideal life, either for the individual or the state. Is there not a tendency to a similar error in our educational system? Does the boy exist for the school or does the school exist for the boy? If child-study is anything more than a fad, and we certainly believe it is, educators are trying to work out the true practical answer to this question, and the watchword is not only, "the greatest good to the greatest number," but the greatest good to each individual. The writer would not be understood as offering an argument in favor of lowering the standard of work in our high schools, but as offering a plea for the two thirds of our pupils who drop out of school after one, two or three years of not very successful work. If by an increased range of optional studies we can keep half of this two thirds of pupils in school, even if their work is somewhat easier, have we weakened our school for the students who with better natural endowments, or with better habits of work, or with more encouragement at home, will still continue the more rigorous courses?

In a certain graduating class the writer noticed that fully half those finishing in the English course had started Latin and were discouraged the first year and that about half those who took the scientific course elected it after two years rather because of being discouraged in Latin than on account of any preference for the science work. Suppose, for the sake of argument, that the scientific course is easier than the Latin or classical and the English course still easier; suppose farther that the English course graduates are inferior in general scholarship to the classical graduates; is it not best, on the whole, to offer

this variety of courses and keep students in school who would otherwise become discouraged and leave? If this is conceded, may it not be maintained that every school should offer as large a range of work as is practicable from the size of the school and the number of teachers employed?

Many principals will say that no optional courses are possible as the utmost effort is necessary to prepare students for college. Commissioner Harris says, "Only 3 per cent of the high school graduates receive any farther education." Probably the proportion in Michigan high schools is larger than that, yet the function of the secondary school is to fit for life and incidentally to fit for college or the university those who expect to enjoy these advantages. It has frequently been argued that the preparation for college is the best educational training for those whose graduation from high school is the commencement of the business of life. The point need not be discussed at this time.

It will be argued against elective work in the high school that the personal idiosyncracies of immature boys and girls at the age of fourteen or fifteen should not be consulted in framing their plan of work. Probably the university professors see mistakes enough in the choice of elective work by those who have arrived more nearly at years of discretion. It must be granted that in large schools offering six or seven courses of study the work of classifying a large number of pupils in the studies that may be pursued with greatest advantage by each person imposes a great responsibility upon the teachers. But when by careful consideration and consultation the classifications have been well arranged, the results should be more satisfactory than in a small school with a more limited range of academic work. Intellectual independence must begin somewhere, and where can it be under greater safeguards than in the high school? Possibly if we can lead our pupils to think more in planning their own work, and to look thoughtfully into the future, there will be less misdirected effort and failure in the college and university life.

Again, it will be argued against elective work in high schools that it will lead to a desultory, dissipated course of study that has no particular purpose in view and accomplishes no particular end. This evil can be guarded against by making studies elective in related groups, though these groups are less than a four years' course; for instance, a group of related studies in English; another group in science, another group in history and government. This is the basis of the special

courses arranged for individual students in the Lewis Institute, Chicago, and it certainly seems probable that this new and richly endowed school should be conducted according to the most advanced educational ideas of the time.

Again, it may be argued that elective work in the high school would lead to early specialization which is not desirable. This may be true to a degree, but genius will specialize under any circumstances.

While a newsboy on a railway train, Edison specialized in electricity in the baggage car. It is well enough to argue that the high-school life is too early a period for specialization for the student who expects to go to college, but how about the great majority who have no such expectation? If the high-school curriculum be so arranged as to enable the boy to discover a talent or bent that determines his future vocation, or if it can afford training along the very line of work at which he may earn his living, the school has certainly prepared him for life in a very practical way. We live in an age of specialization. The man who is not a specialist earns a dollar a day at any labor his limited attainments enable him to perform. The highest success in the educational profession as in other walks in life is attained by those who have mastered thoroughly some department of educational work.

Teachers, as a class, regard unfavorably any argument from the utilitarian standpoint of a high-school education. Taxpayers, on the other hand, rate the value of the school chiefly from this standpoint. Any increase in the elective work in our high schools will meet with the approval of the taxpayers.

It is not the purpose of this paper to indicate definitely the wide range of work that might be made elective or optional. The science men, who have so large a part of the attention of the Club at this meeting, could suggest and have already suggested many profitable lines of work. The gentleman who is to offer the next paper on this subject will tell where elective courses should come and, perhaps, what should be the nature of these courses.

To sum up in a different order from that before followed some points leading to an affirmative answer to the question: "Should elective courses be provided and encouraged?"

1. A wide range of work will in general meet the approval of the parents, patrons, and taxpayers.
2. It allows a classification of the pupils according to their various needs and abilities.
3. Elective studies will allow students whose education ends with

the high school a desirable opportunity for some measure of specialization.

4. A spirit of intellectual independence of students may be fostered by a judicious use of elective studies.

5. The number of pupils who become discouraged will be decreased. The number who will stay in school and complete some course of study will be increased without materially lowering the standard of work.

W. H. SMITH

PONTIAC, MICH.

DISCUSSION ON ELECTIVES

PRINCIPAL A. J. VOLLAND, Grand Rapids: The Grand Rapids High School offers sixteen courses, which of itself means offering a large number of electives.

At the beginning, the choice is mainly between English, Latin, and German further differentiation taking place later on. A special course is also offered, based upon any of these sixteen courses, and consists in offering a choice of commercial law, physical geography, and astronomy, for algebra 10-2, geometry 11-2, and the review of algebra and geometry 12-2. This is designed for those pupils who find mathematics a stumbling block.

In the Commercial course there is a large number of options in the eleventh and twelfth grades, whereby a student may take a foreign language instead of history.

In some of the other courses an option is offered between chemistry and some other subject not required for admission to the University of Michigan.

For a number of years there was an Elective course, in which a pupil might, with the advice of the principal, choose such work as was adapted to his capabilities. In the class of 1890, there were nine who graduated in the Elective course; in 1891, eight; in 1892, seven; in 1893, seven; in 1894, five; in 1895, nineteen; in 1896, thirty; in 1897, seventeen.

If the present policy is persisted in, there will hereafter be no graduates from a purely Elective course.

SUPERINTENDENT W. G. COBURN, Battle Creek: The scheme of electives as presented by Mr. Harris is very similar to the Battle Creek High-School courses of study as prepared for the year 1897-8. In place, however, of the election of studies as such, we allow the election of courses, there being eight to choose from, namely: The Classical, Latin, Scientific, Latin-Scientific, Latin-English, German-English, French-English, and English courses. In the first two years, the students of all courses have three studies in common. For the fourth study, they must choose between the Latin and English, which determines what course they are to pursue.

In the third year we offer no electives, but in the first half of the fourth

year the classical student is required to take Latin, Greek, and physics, and may elect as the fourth study any one of the following: English literature, algebra and geometry, or chemistry. In the second half of the fourth year he is required to take Latin, Greek, and United States history, and may elect either English literature, trigonometry, or chemistry. The Latin course is similar to the classical so far as the electives are concerned. In each of the other courses two studies are required for each year, and two are elective.

Although we offer an English course, which does not prepare especially for the University of Michigan, yet in a class of 126 there are not more than twenty taking no language. In the second-year class in the high school, which numbers ninety-three students, there are about fifteen taking the English course, while in the junior class there are but three students who have taken no foreign language. In the fourth-year class, or this year's graduating class, we have no students in the English course, every student having taken at least two years' language; and out of a class of forty-one students, twenty-one have elected the Classical course.

This shows that the English student either drops out of school before graduation or after continued study in the high school develops a taste for language.

B. A. FINNEY, University Library: In looking over the schedule proposed by Principal Harris I am not surprised to notice the absence of a subject of study in which I am interested and which, it seems to me, might very properly have a place there, and it seems now a fitting opportunity to suggest the inclusion of this subject in the high-school curriculum.

It is the study of bibliography.

By the term bibliography, in this connection, I would not so much mean the history of books and bookmaking, of writing and printing, or the practical details of library technics, as a more simple knowledge of the ordinary indexes, reference books, etc., and instruction in the use of these bibliographical tools which are so useful and necessary in all topical reference and research work.

I am not aware that any formal instruction in this subject has yet been given in high schools, although there has of course been more or less occasional assistance and suggestion from the teachers in connection with their work. Instruction in bibliography is now given in a number of our colleges and universities, the earliest of which was the course inaugurated by our librarian, Mr. R. C. Davis, in the University of Michigan, in 1879, and continued successfully as an elective study. There are also several schools devoted more particularly to library science.

Now, considering the growth of the libraries affiliated with the different high schools, and the development of a broader system of instruction whereby the teachers call upon the pupils to make more and more use of the books in these libraries—and considering the lack of acquaintance with the methods

and implements requisite for working up these materials, which is not only universal among the pupils but not uncommon among the teachers—has not the time arrived to introduce a definite study of bibliography into the high school curriculum?

If only a short course were tried, somewhat early in the high-school years, I feel sure it would become the hand-maid and help of nearly all the other studies, whether literary, historical, or scientific.

A. R. CRITTENDEN, Ypsilanti: The question of electives in the high school is an interesting one, and has certainly been presented in a very able and attractive way this morning. In my judgment, however, we may well ask ourselves whether our high-school courses of study have not been too largely made up of shreds and patches, and whether there is not at present a very commendable tendency toward the unification and systematic arrangement of these courses. It has been truly said that this is an age of specialization; but does it follow that we should offer larger opportunities for specialization in the high school, or should we rather endeavor to give our students a broad, thorough, and symmetrical training as a foundation for later specialization? The question has been raised as to whether the introduction of electives would not increase the size of our graduating classes. Granting that there would be a slight increase, shall we gain any substantial advantage by labeling as graduates of our high schools a few students who are unable or unwilling to complete a rational and thorough course? Ought we not rather to leave our classes open to all such students, but restrict graduation to those who have completed a definite amount of work in a logical and symmetrical order?

SUPERINTENDENT C. L. BEMIS, Ionia: In discussing this subject there seems to be no thought of any class of pupils but the best, the brightest. The weak ones are left on the mountains to perish.

Every child in the country should have a place somewhere in the school system of the state where he can be trained, the best there is in him brought out and be made ready for use in the future. Not only the strongest pupils should be taught, but all grades from these to the feeble-minded should be given a place in the schools of the state.

There are special schools for the feeble-minded, for the blind, for the deaf, and for the morally depraved, all other children fall into the public schools and should have a chance in proportion to their abilities. Now when we make a course in the high school, iron-bound for one class of pupils as those who readily take up language, or those who readily take up science, and give other pupils no chance to get the culture that comes from a study of the many subjects that can be covered by a knowledge of English only, we are putting educational matters in such a condition as to bring about untold injustice to the medium and weak pupil.

It is not the brightest pupils who do the most for the world. On the contrary it is the thinking, plodding pupils. It does not pay the country to have a school in which to show off a few bright boys, whose names never go beyond their own town, at the expense of the many who are counted medium or dull. There should be a place for all, and everyone should have a chance to get all the culture he can along any line he prefers to follow.

SUPERINTENDENT THOMPSON, Saginaw: I have been greatly interested in the discussion so far. It seems to me, however, that the courses with optional studies presented do not differ materially from those now in use in our high schools. The form only is changed, and, I think, to the disadvantage of the new schedule. I believe the present plan of having a definite course with a clearly defined end in view, viz., preparation for a corresponding course in the university, is better than to require the pupils (immature as most of our high-school pupils are) to select each study. These pupils know very little about selecting studies and less about what studies are required to meet conditions in the university; so they would have to depend largely on the judgment of the superintendent or principal. This would add to his already too numerous duties, and without any special advantage.

The plan suggested of lightening the work of the first semester is excellent and, I believe, will save some failures in the high school.

One thought more. I should be glad to see the English course abolished as a distinct course. After an experience of four years in our own high school I am convinced that this is highly desirable and entirely feasible. Let every pupil entering the high school take Latin or a modern language and distribute the English work over the other courses so that *every* pupil will have a *thorough course in English* instead of the one fifth or one fourth as is common.

I can see no good reason why the classical or modern language student should not study English grammar and English composition for instance. Again, it has been the experience of many superintendents that the poorest students choose the English course on entering the high school, with the thought that it is the easiest course and that the pupil who finds his Latin, French, or German difficult desires to drop it and enter the English course, thus making this course still weaker in its make-up. And again, if a good student finds after a year that his work is not leading him strongly, if he changes to another, he has a year or more of language work to make up, thus placing him at a disadvantage. These and other motives led us to make the change. In our high school every pupil studies either Latin, French, or German from the beginning (the Greek coming in after two years for those who wish it), and, on the other hand, *every* pupil gets a *strong course in English. It works.* The difficulties mentioned are largely overcome.

I would, however, have optional studies for those pupils who can and are willing to do heavier work than the ordinary course requires. There are a number of pupils in every high school who can do *extra* work. Let the optional studies come in here.

PHYSICS IN THE HIGH SCHOOLS OF MICHIGAN.

BELOW will be found some interesting statistics and expressions of opinion concerning the instruction in physics in the high schools of Michigan. They were called out in this way :

At the spring meeting (1897) of the Michigan Schoolmasters' Club the present writer read a papèr upon the laboratory side of the instruction in physics in the state, the object of which was to show, first, that the time allowed both to pupils and teachers for laboratory work was often inadequate ; second, that few schools—even very good schools—were supplied with conveniences for storing and handling apparatus with proper care ; and, finally, that the policy of many schools was so shifting and changeable as to make any equipment, however expensive, speedily obsolete and proper material for the waste heap. The exposure of apparatus was particularly insisted on, and it was urged that in some of the larger schools and in many of the smaller, valuable pieces, and even whole collections of apparatus were stored and used under such conditions that few pieces lived out half their days : that, indeed, the epitaph upon much of our high-school apparatus might well be that of the caddy in the golf story, "Died of standing around." Here was the center of the apparatus difficulty.

The contentions of the paper, founded upon many years of school visitation and correspondence, were thought to be worthy of attention and a committee was appointed to carry forward the investigation and incidentally to secure other information concerning the instruction in physics in the high schools of the state.

It will be seen that the statistics given below, collected by this committee, support the first contention of the paper but by no means justify either of the others.

The replies to the circular were in general full, explicit, and indicative of much thought and care. Many of them well deserve publication in full. No large school in the state failed to respond. Unfortunately the circular was sent out so late in the school year that many replies were not received until the new school year opened. These are not included in the "Analysis of Replies" below. They would, however, hardly change the character of the result.

CIRCULAR

MICHIGAN SCHOOLMASTERS CLUB. PHYSICAL SECTION

To the Teacher of Physics in. Public School.

Dear Friend :

The undersigned, a committee appointed by the Physical Section of the Schoolmasters Club at its last session to recommend means of advancing and

unifying the instruction in physics in our high schools, earnestly request you to fill out the inclosed circular and return to the chairman of the committee at Ypsilanti, Mich. They make this request with great reluctance, aware that you have been asked to perform such a service so often that it may have become a burden, but asking you to remember that there is no other means of communication between teachers, and that their only motive is the desire to advance the scientific teaching in our public schools. The summary of the facts and opinions gathered will be sent you if desired.

If you cannot answer all the questions please fill out as completely as possible. If the teacher of physics is also principal kindly indicate that fact. If a change of teacher is to occur in this department for another year please give the name of the incoming teacher, if known.

The committee also desires your opinion upon any or all of the following questions. Please reply upon the blank space at the end of this sheet or otherwise as you choose:

a. If you could have but one laboratory course ("student's" or "table" experiments, as distinguished from "demonstration" or "teacher's" experiments) in physics *or* chemistry, which would you prefer, and why?

b. If but little time can be given to laboratory science what would you think of singling out one or two sciences (as physics and botany) for extended study with full laboratory work, and giving only brief text-book courses in the other sciences, or dropping them altogether?

c. If your physics course is at all unsatisfactory when measured by the highest standards, what is the main trouble? Is it lack of apparatus and equipment; or lack of time to prepare and oversee the work; or lack of time on the part of the students for both class-room and laboratory work; or some other limitation?

d. If your people are backward in supplying you with apparatus how do you account for it? Is it at all, as you judge, because material (books, charts, maps, apparatus) has not in the past (perhaps in the distant past) been well cared for or well used? Is it because of a change in the policy or the main interest of the school which has made a particular equipment no longer useful?

e. In a *small* high school—your own or any other—do you esteem it wise to attempt a laboratory course proper in physics in addition to the usual text-book and demonstration work? Under what circumstances would you think it wise?

Yours, respectfully,

E. A. Strong, }
K. E. Guthe, } Committee
C. L. Bemis, }

STATISTICS CALLED FOR

1. Physics in what year?..... 2. No. of weeks given to this subject?..... 3. No. of recitation periods per week..... 4. Length of recitation period..... 5. How much of this time (if any) is given to laboratory work proper (table experiments)?..... 6. How much *additional* time (if any) is given to laboratory work?..... 7. You have tables (if any) for how many students?..... 8. Have you a laboratory course in chemistry?.... 9. How many tables?.... 10. Approximate cost of demonstrative physical apparatus?..... 11. Of laboratory apparatus?..... 12. Have you a school period free from other duties for the preparation of experiments?..... 13. Do you allow desultory

laboratory work, students practicing when they can get time?..... 14.
Do you have any laboratory work at which a teacher is not present?.....

ANALYSIS OF REPLIES

The circular was put out so late in the year that of the 350 or so schools teaching physics in the state only 210 were addressed, and from these only 82 replies were received.

Replies to *a*, *d*, and *e* above, interesting but hard to summarize.

b. Also difficult to summarize. Very few would put all the work upon two sciences. A large majority insist at least upon botany, physics, physical geography, physiology, and chemistry. There is also a large vote for zoölogy, geology, and astronomy, and other sciences are named.

c. As to the *main* difficulty, *three* would place it in poor preparation in English and mathematics, and many refer to this as a hindrance.

Sixty-eight place it in lack of teaching force, often expressed as lack of time.

Many find it in insufficient apparatus and laboratory conveniences. Not a few place this difficulty first, but the general opinion seems to be that it is easier to get apparatus than teachers.

Mention is often made of the fact that *students* have not time for laboratory work, especially classical students.

1. Out of 82 schools 25 report physics in the twelfth year of the course; 4 partly in the eleventh and partly in the twelfth year; 42 in the eleventh year; 10 in the tenth year, and 1 in the ninth year.

2. Seventy-nine out of 82 schools report a full year of physics, either of 36, 38, 39, or 40 weeks. Three report from 24 to 30 weeks.

3. 1 school reports 7 periods per week.

77 schools report 5 " " "

4 " " 4 " " "

4. 3 schools report a period of 60 min.

3 " " " " 55 "

4 " " " " 50 "

23 " " " " 45 "

22 " " " " 40 "

9 " " " " 35 "

18 " " " " 30 "

— " " an average " 40 "

5. Of the 82 schools 44 use some portion of the usual 5 periods per week for students' laboratory work. Most give 4 recitations, lectures, or demonstrative lessons, and one table or laboratory lesson, each week. Out of a possible 180 to 280 periods per year,—

5 schools have 120 laboratory periods.

1 school has 100 " "

10 schools have 80 " "

1 school has 70 " "

2 schools have 50 " "

18 " " 40 " "

7. " " 20 or fewer laboratory periods.

6. Thirty-four schools of the 82 report *additional* periods (often in the afternoon or out of school hours) for laboratory work.

2 schools have 200 additional periods per year.

4 " " 120 " " "

6 " " 80 " " "

17 " " 40 " " "

5 " " 20 or fewer additional periods per year.

34 " average 66 additional periods per year.

7. Thirty-three schools report a physical laboratory with tables for from 4 to 90 students, averaging a table for each of 20 students. A few schools report some substitute for the usual tables.

8. Fifty-one schools report a laboratory course in chemistry, usually of a full year.

9. The number of chemical tables varies from 1 to 40, averaging 14.

10. Fifty-five schools report cost of demonstrative apparatus varying from \$5.00 to \$5,500.00 and averaging \$347.00. Many do not report this item; some report all apparatus under this head and some under the following.

11. Thirty-eight schools report an average of \$201. Some say "considerable," "sufficient," "many pieces, but of little value," etc.

12. 7, Yes.

11, "Occasionally," "usually," and "for all sciences."

57, No. "A recitation every period," etc.

13. 12, Yes.

66, No.

14. 24, Yes.

51, No.

3, Approve this course.

11, Strongly condemn it from experience. Many think it a necessary evil.

E. A. STRONG

YPSILANTI, MICH.